Deep Fake Architecture

An Honors Thesis (Arch 402)

By

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Abstract:

Through a series of deep-fakes designed to create a hybrid of two well known buildings, in combination of designing for a collector of Wassily Kandinsky Paintings this thesis looks to explore the architectural language of a single family home, and the systems and structure used in one. To showcase the collection while providing all the amenities one expects living in a single family house, the concepts of public vs. private spaces where explored and challenged, and the idea of what is comfort became an important design consideration. At the same time the importance of protecting paintings, and how one needs to protect them guided a conversation in materiality, mechanical systems, passive systems, and overall design.

Throughout the thesis you can follow the evolution of the building from precedent studies to conceptualization to the final building design, seeing what was learned in each step of the process, and how it impacted the final design. As all great architecture is never truly finished the building is designed to continue to evolve as the client would need it to, with the ability to go back and modify different elements where needed.

Acknowledgments:

I would like to thank my advisor James F. Kerestes for being such a great help during the process. He was able to help me learn new softwares which I am going to take with me into graduate school, explore architecture in a different thought process, and was able to make the transition to digital classes easy. At the same time he was able to provide feedback at a moments notice and was always willing to help in any way possible.

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1 Process Analysis:

This project has become one of my most in depth from a creative standpoint. This was a new and different way of thinking for me and was a direct result of not only the thesis but the class itself which challenged a different thought process. This thought process allowed me to experiment more in different software's and mediums and grow overall as a designer.

Starting the project off we were tasked to select two significant homes off a list for precedent study. This precedent study would see us not only remodel the buildings digitally themselves which allowed us to learn about how they were created but would challenge us to look at abstract ways of representing the work. This would prove to be a new approach for me, and one that I struggled with initially. To better understand what I was doing myself, and for others when trying to explain it, I broke the precedent houses into key vocabulary and found a similar word that was able to represent both projects interlocking. As a result, I used this vocabulary to guide my development of the abstract drawings that will be viewed in the thesis. The word interlocking would also become a strong representation of the project throughout, as it was simple enough that anyone could understand it but deep enough to result in great variation in architecture.

Following the creation of my own deep-fake it was time to generate deep-fakes using digital software. The resulting images allowed me to see what the computer saw as the similarities and differences in the house and allowed me to use that information to further develop my own deep-fake. The images generated where viewed in color and black and white, and to even see the simplest of the design where converted to 16bit black and white only which removes all detail. This step in the project was pivotal in understanding how the buildings where similar and how they were different.

The program in architecture is one of the most important things to consider when you are designing a project as it guides most all of your choices. In this case the program was already set as a single-family home, but we got to further it by choosing a collector and figuring out how a house could be tailored to the collection of that specific item. For my collection I chose original paintings, and under the guidance of my advisor focused in on one specific painters work, Wassily Kandinsky, one of the most regarded cubist painters of the twentieth century. I chose Kandinsky specifically as his style of paintings had a lot of the same key vocabulary as the precedent houses did, most importantly overlapping. It was decided by me that the collection would be integrated throughout the project, and that the building itself would house two people, and only one full time. I chose this as I was imagining the space as a place for an artist collector who would be able to host a scholar if they wished to. At the same time creating the program allowed me to remove some spaces I found unnecessary in a modern home, or home of the future, such as a garage. This step in the project guided me going forward and allowed me to move into the massing generation process.

The next step in design after defining the projects program and requirements is the actual design. One cannot simply just jump into design and for me early design is a time of experimentation and trial and error. To experiment with the initial design of the building I used the architecture software Rhino to quickly generate over 100 different massing options. These massing options explored how geometry could interlock. A chosen form was modeled physically in order to gain a basic idea of how it would be built. I have always believed if you can not easily model it, then it can not easily be built. This would result in editing the digital model with information learned from the physical. The chosen geometric form, which is shown exploded in the thesis along with some of the other options, was then modeled again physically in a larger scale. This initial generative massing is something I always do but, in this project, it was different as I skipped over the site analysis phase as we were designing in a theoretical vacuum which allowed us to be more explorative with the building. This was something I have mixed feelings on, as I normally like to be able to specify a building for a specific site for this project, I understand why it was done as it focused more on the creative exploration of architecture.

Once the final building mass was selected it was time to develop it. This step is known as design development and about 50% of the semester was spent on this phase. This step would see the concrete and steel structure system designed during this time. It would also see the exploring of how to protect paintings and the systems needed to do so. A great resource for this was Kandinsky himself who had published a book on how to view his work, and this would be supplemented with modern techniques of how to supply systems to a building. All the sources I used during this phase are cited in the bibliography. This step in the process also saw the largest physical model produced for the project. The physical massing model allowed the building to be viewed in three-dimensional form and was a good conversation starter during the mid-term pinup. It was originally planned that there would be multiple final models built, but due to the ongoing pandemic that was sadly not an option. The midterm which occurred during this phase also was able to guide the discussion of the project and allowed for the development of individualized spaces, and how those spaces related to the concepts of interlocking, and the collection of art itself. This critique process is very important in architecture and something I really enjoy from my profession, as it allows architects to talk about what works and what does not, and allows for the availability to bounce ideas off of each other, and defend their own.

The midterm presentation was a lot simpler than the final presentation, whose drawings are seen in the thesis. The time after the midterm prior to the final for this reason is normally a process of less design and more presentation style, and corrections of errors found during the midterm. For me this and detailing the project was the major last step. The detail of the

actual site plan was created in a way that paid homage to the deep-fake drawings, cubism, and the building, and interior finishes were studied. This step in the project allowed me to figure out the best way to represent my work, and was pivotal in making sure my project would be understood by my peers. Once again this was a process of trial and error, and studying other drawings. This was one of my favorite steps in the process and one I took the most pride in.

The last step which is one of the most important and the hardest to explain is the final critique process. This final critique is where you showcase your work, gain feedback, and can learn how others would have approached this issue. My final presentation raised some good points about hybridization which if I was to do the project again, I would explore further. At the same time in architecture it is important to remember how subjective the profession is, and odds are if you were to ask ten different people, they would all say something different about the project. This final critique was my first digital presentation, something I found more difficult than a regular presentation but also a great learning opportunity.

Overall, this project proved to be one my most difficult to approach from a design approach but was a project that allowed me to grow more as a designer than any other I have taken on. It taught me many important lessons about design considerations from protecting paintings, to paying homage to other architects works. In the end the project is one I am happy to display in my portfolio and present to others.

2 Project Goals:

01: To create a new suburban single family dwelling for the client (in this case our collector) that is carbon neutral, architecturally interesting, and responsive to clients needs.

02: Using materiality to define building spaces, literal and implied, and to make architectural statements.

03: Using the precedent houses, Alan Voo and Petal, throughout the design process continuing the principles of deep-faking them into a new hybrid. To accomplish this further develop the ideals of the architectural language from the concepts of the seamless edge, silhouette, and cubist design.

04: Ensuring that the design has a tectonic logic that would allow for it to be physically constructed, and that this tectonic logic fits with the aesthetic design of the building.

05: Create a building that protects the artwork inside and is able to showcase the artwork. This should result in the building being a neutral backdrop to it.

06: To ensure the building and the site of the building read as one continuous unit, and flow well together showing that the two were designed as one, and that the same design language is used throughout.

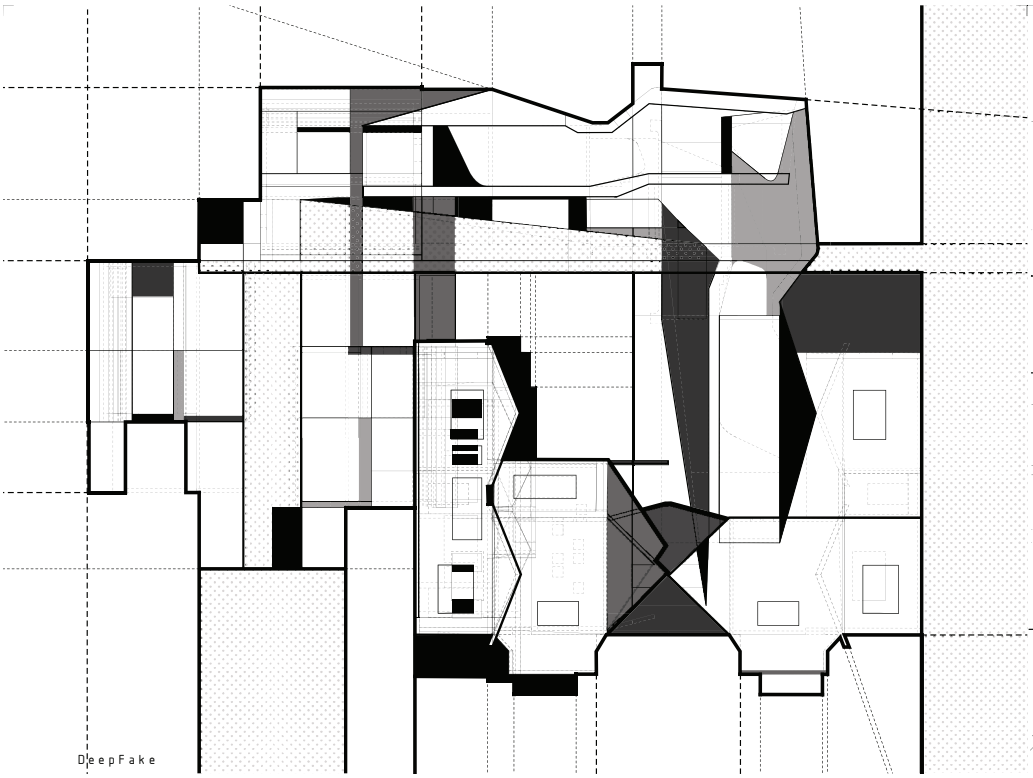
3 Precedent Analysis:

Alan Voo House:
Neil Denari, Architect
Built in 2007
Location: LA

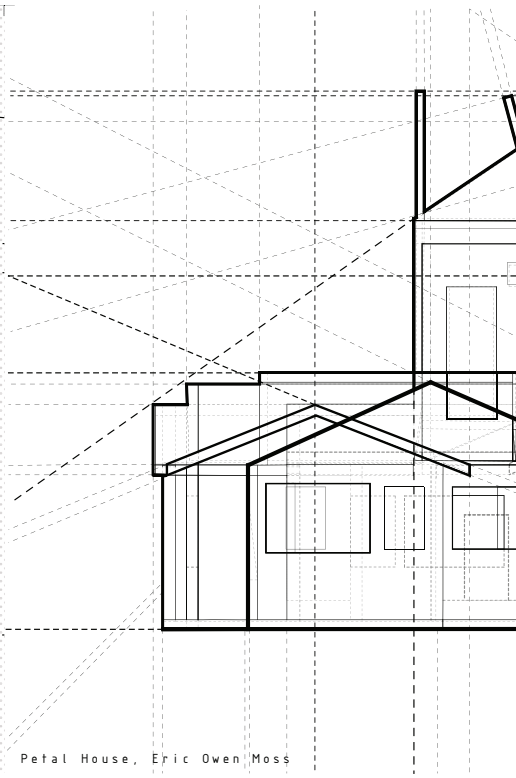
Key Vocab:
Seamless, Interlocking

Petal House:
Eric Owen Moss, Architect
Built in 1982
Location: LA

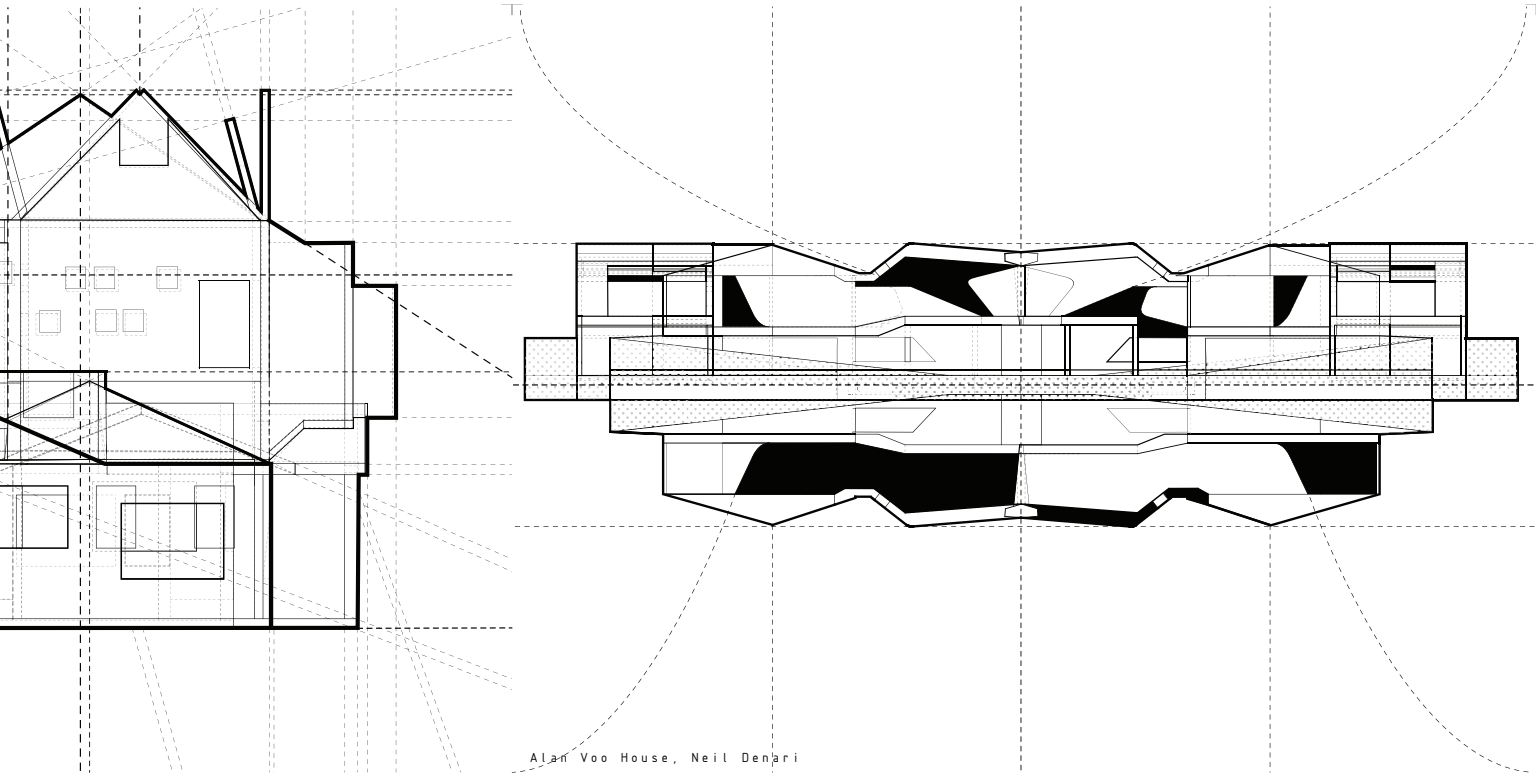
Key Vocab:
Over-locking, Interlocking



DeepFake

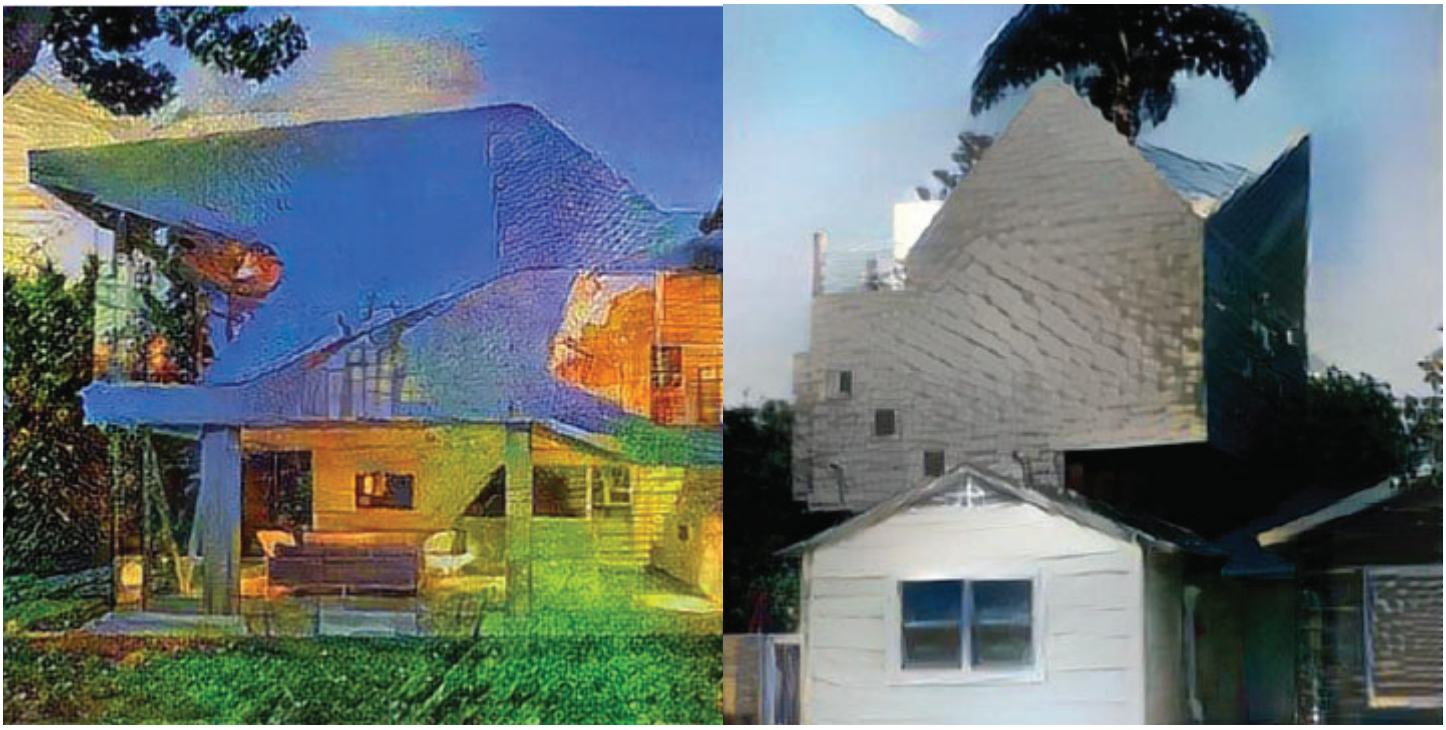


Petal House, Eric Owen Moss

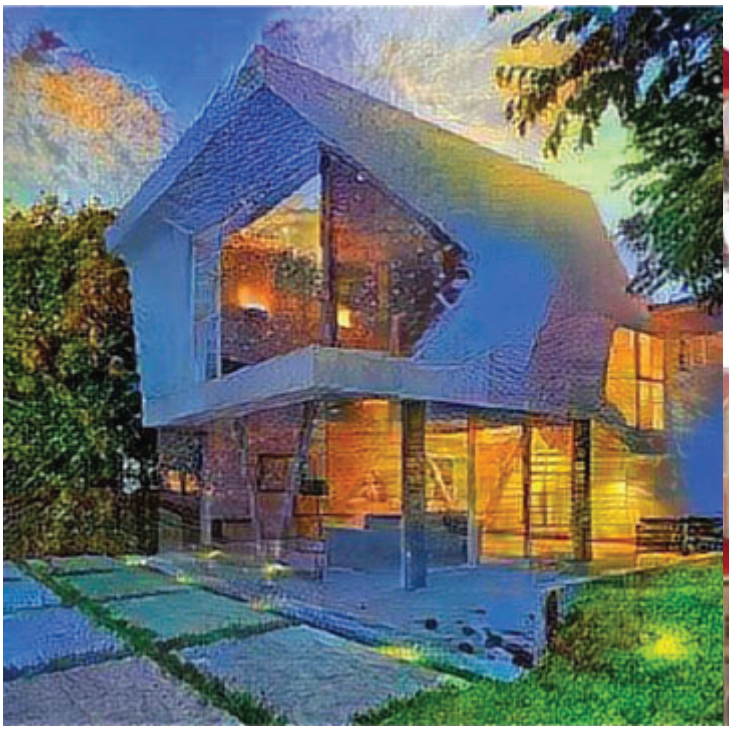


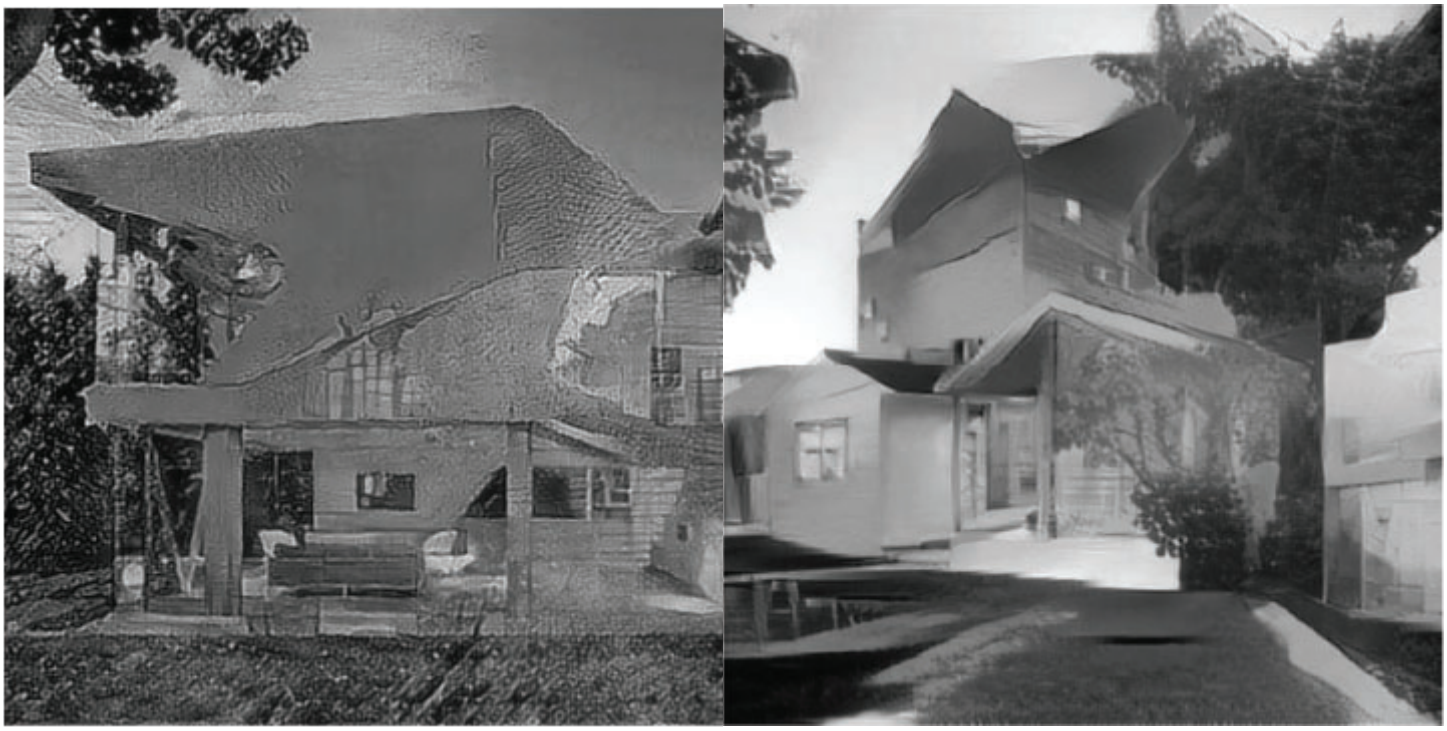
The Drawings: Using a series of abstract drawings the buildings where explored. The drawings showcase elevations and sections and how the buildings are similar and different. These drawings where also designed to showcase the key vocabulary mentioned above, mostly interlocking and seamlessness. The hybrid drawing was designed to become an initial look at deep-fakes, and how drawings can be deep-faked.

4 Deep-fake Process:

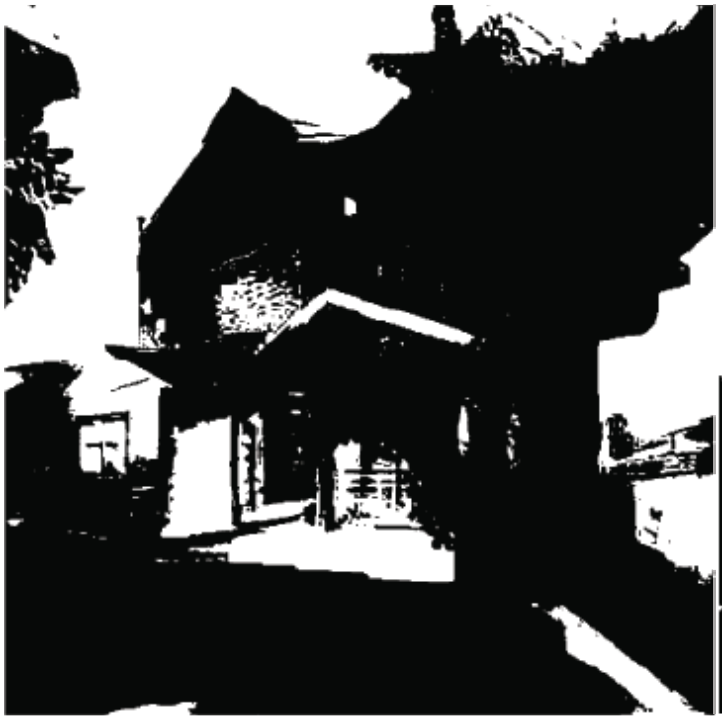


Experimental Deep-fakes: Generated hybrid of the two precedent studies.



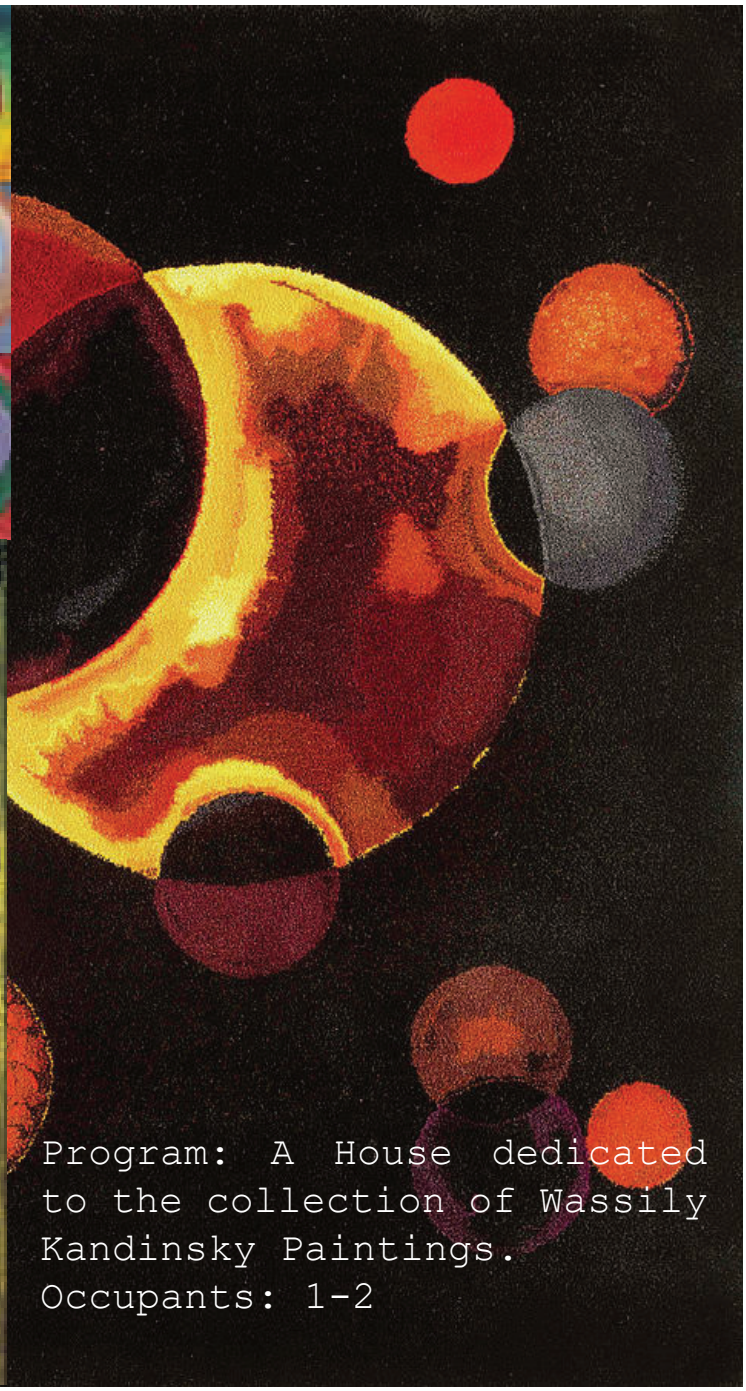


Experimental Deep-fakes: Generated hybrid of the two precedent studies.



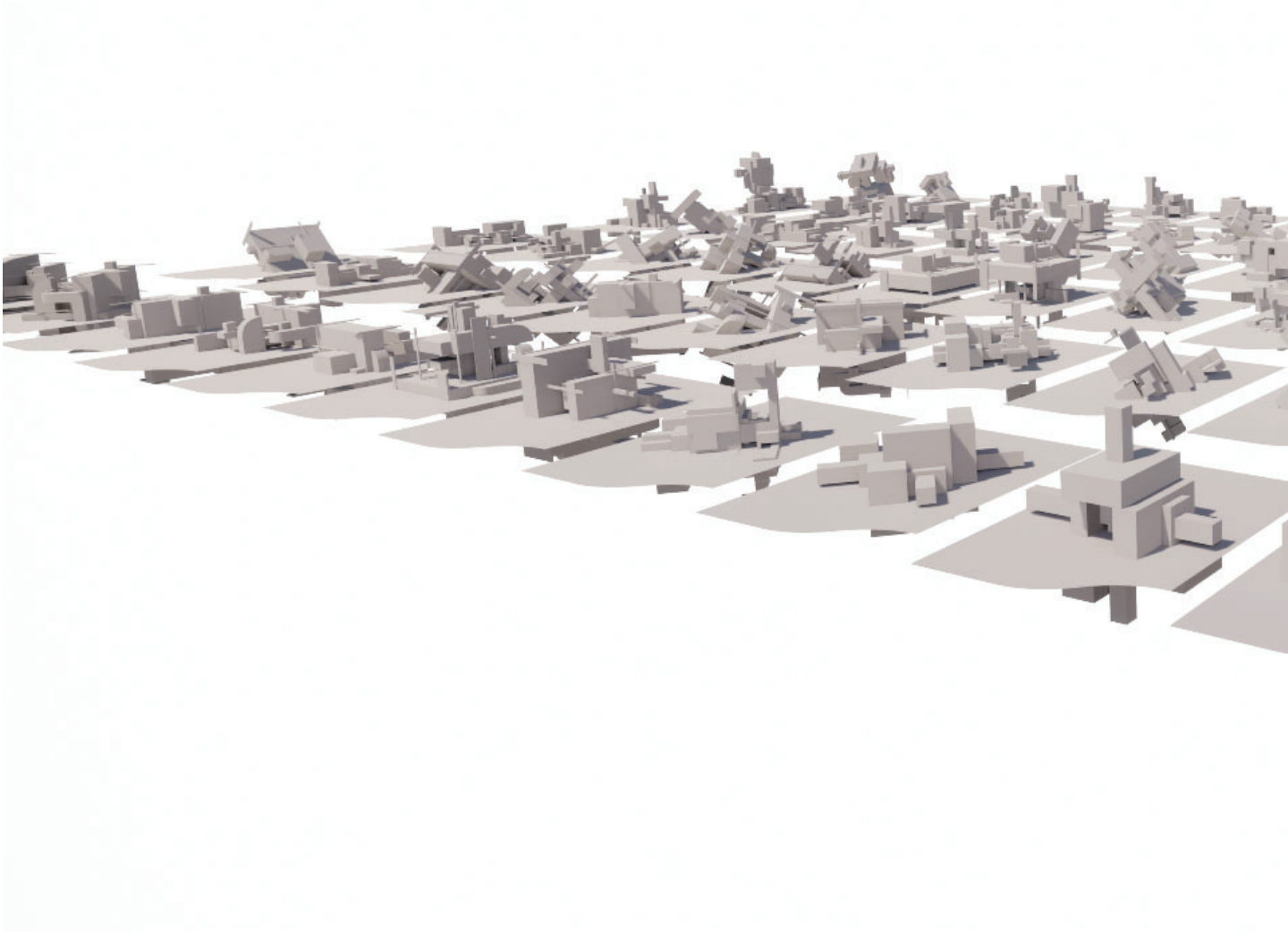
Creating a Deep-Fake Charrette Drawing was a process to begin to hybridize the massing concepts into a formalized building design with set spaces, and dimensions.

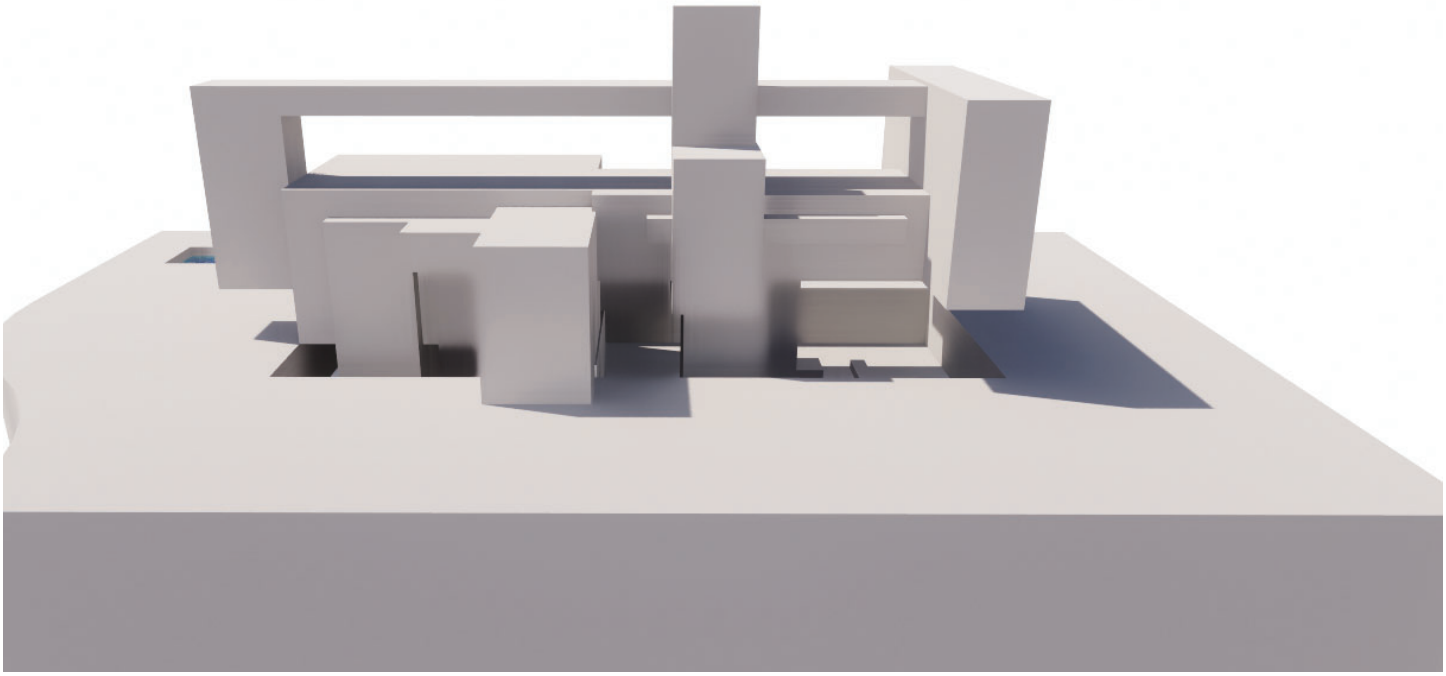
This process was based on the Charrette process and the ideas of cubism which would be a major part of the collection. Later on in the design process this would be revisited and would lay the ground work for the site plan which was finally decided on.

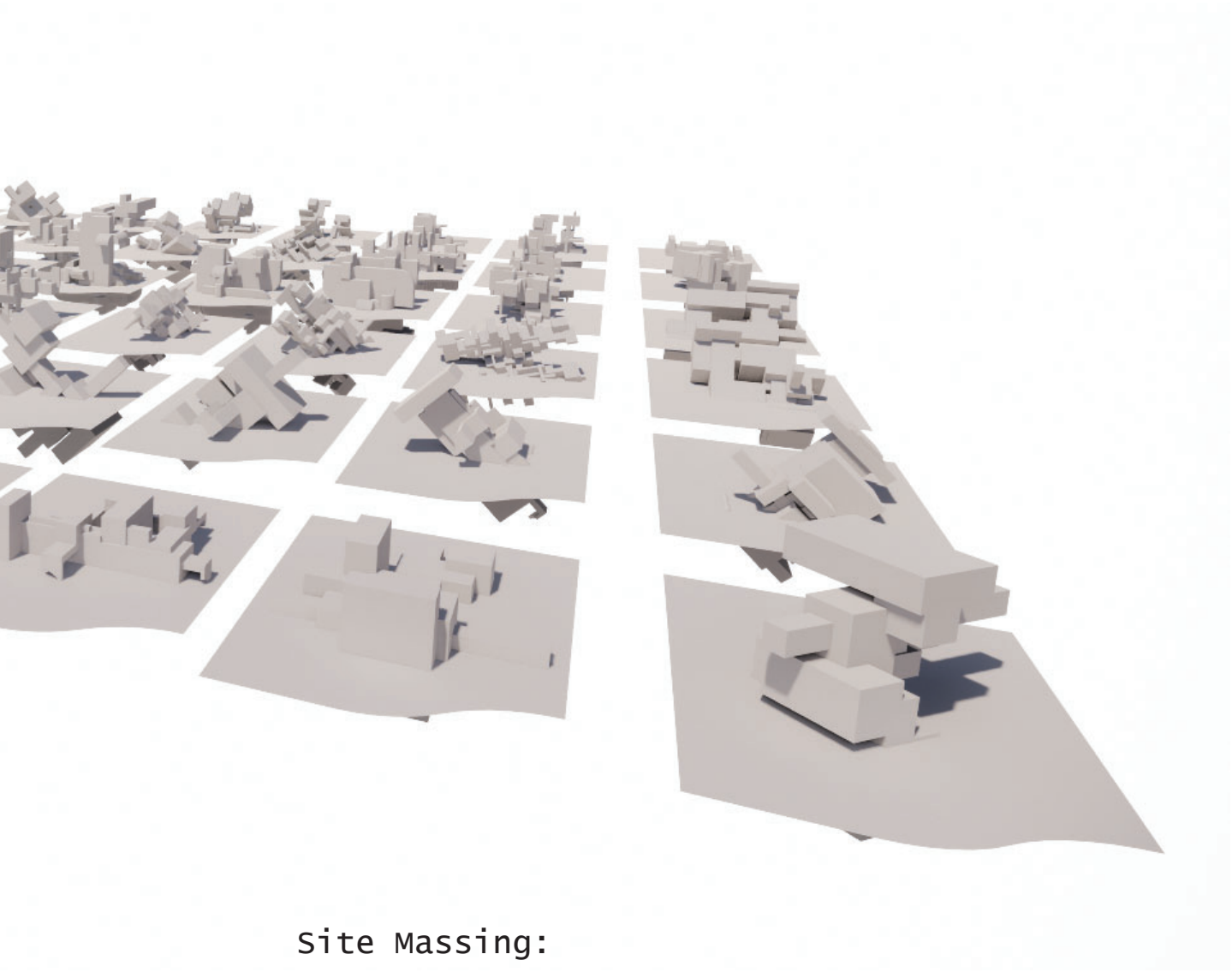


Program: A House dedicated to the collection of Wassily Kandinsky Paintings.
Occupants: 1-2

5. Conceptual Massing:





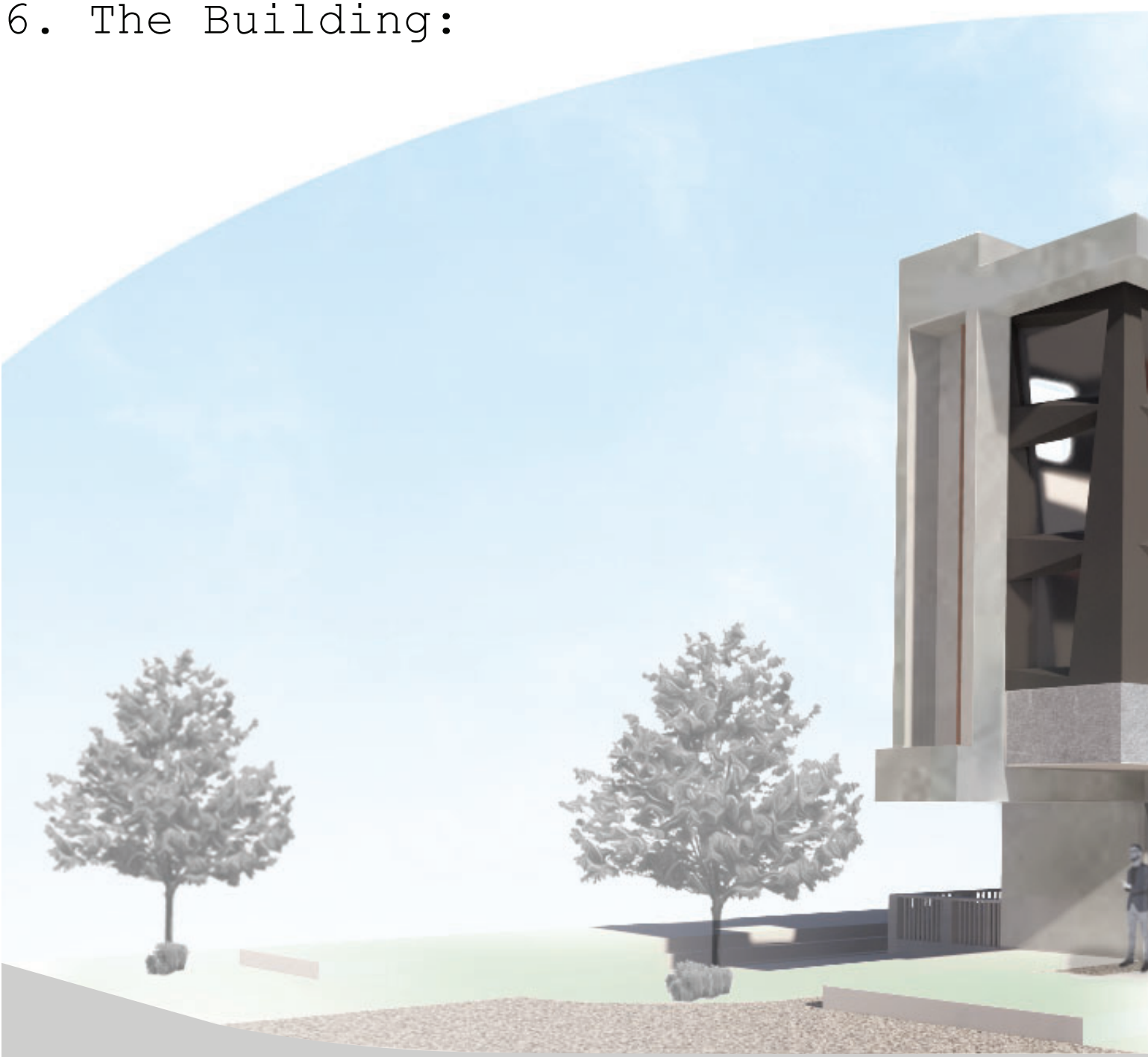


Site Massing:

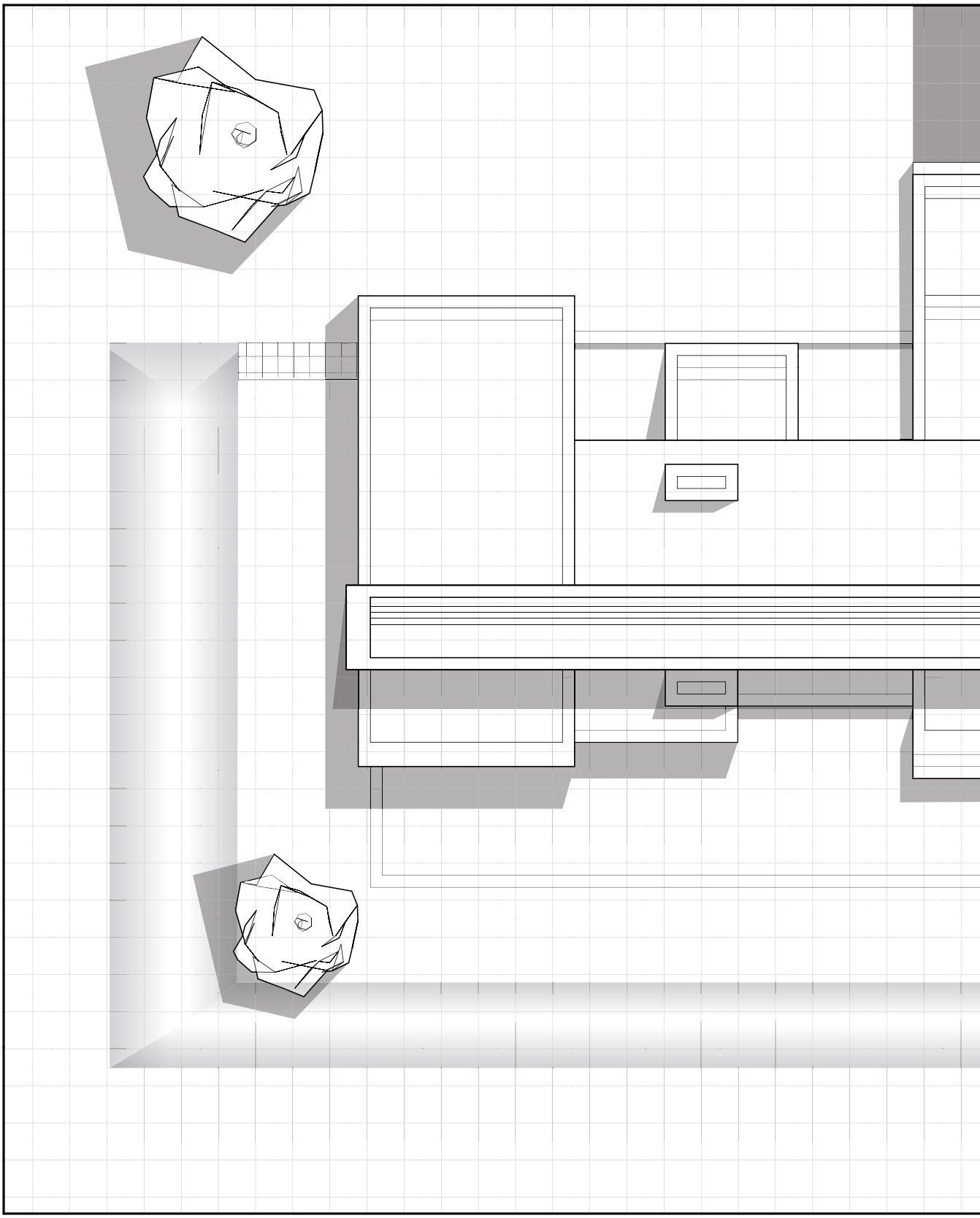
Using generative site massing, different massing options where explored derived from the key vocabulary of the precedent studies and the drawings generated to represent the precedent studies.

In the end the selected Massing is shown blown up. This massing was selected due to the variety of geometries overlapping, the interlocking, and the ability to manipulate the site to showcase this. The massing in itself also worked with the cubism inspiration from the collection itself.

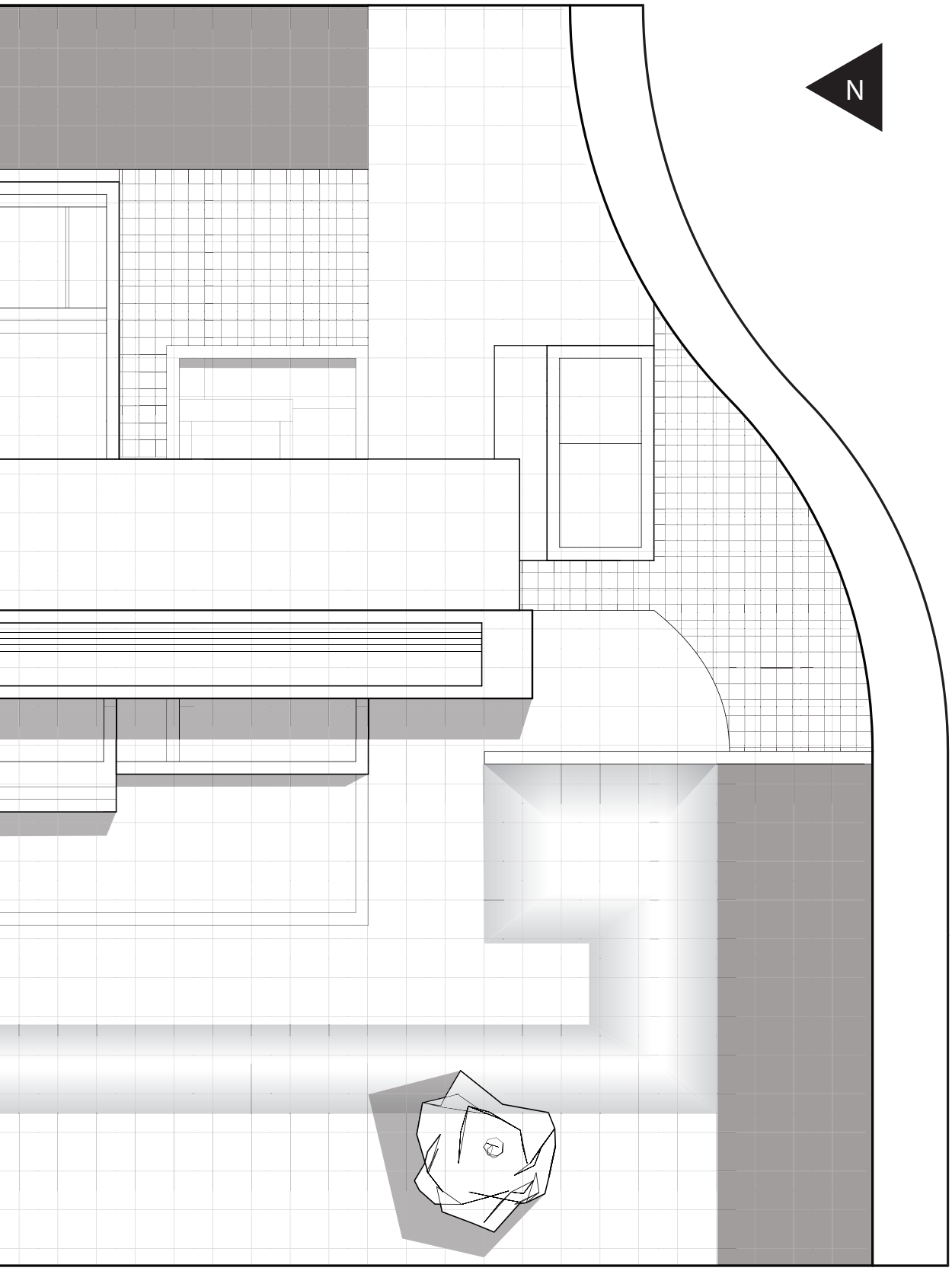
6. The Building:



Exterior Perspective:



Site Plan: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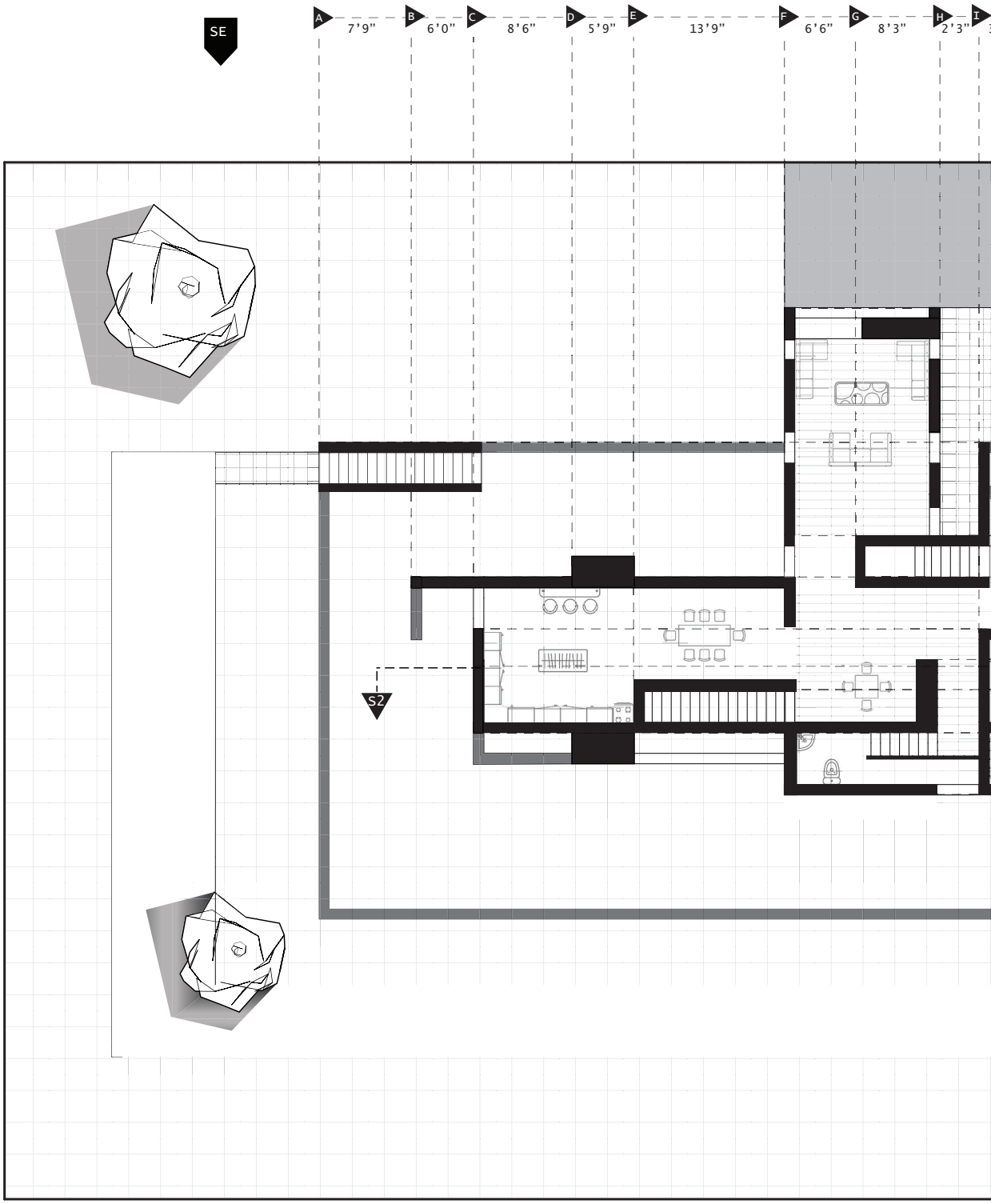
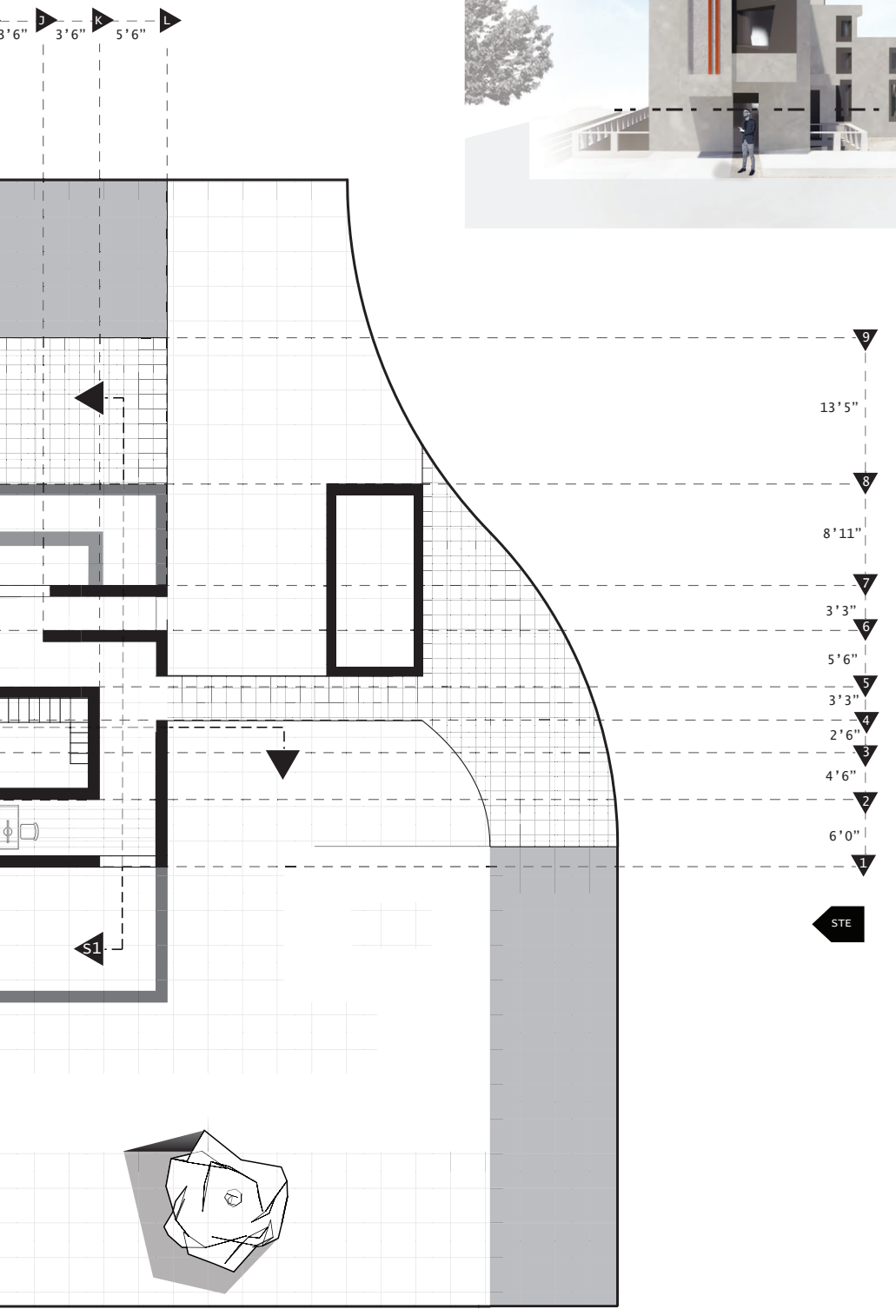


Horizontal Section (Plan) Floor 1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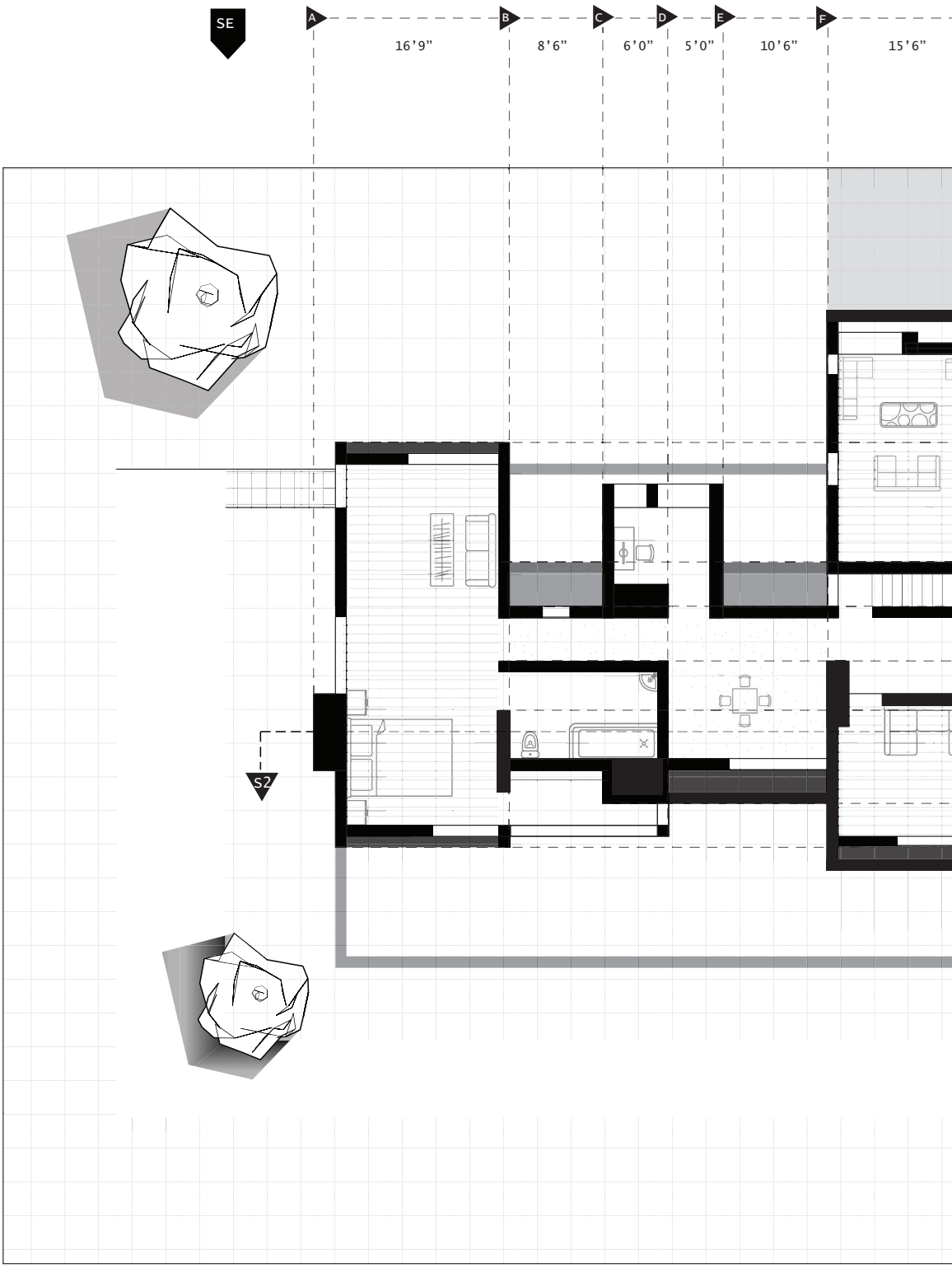
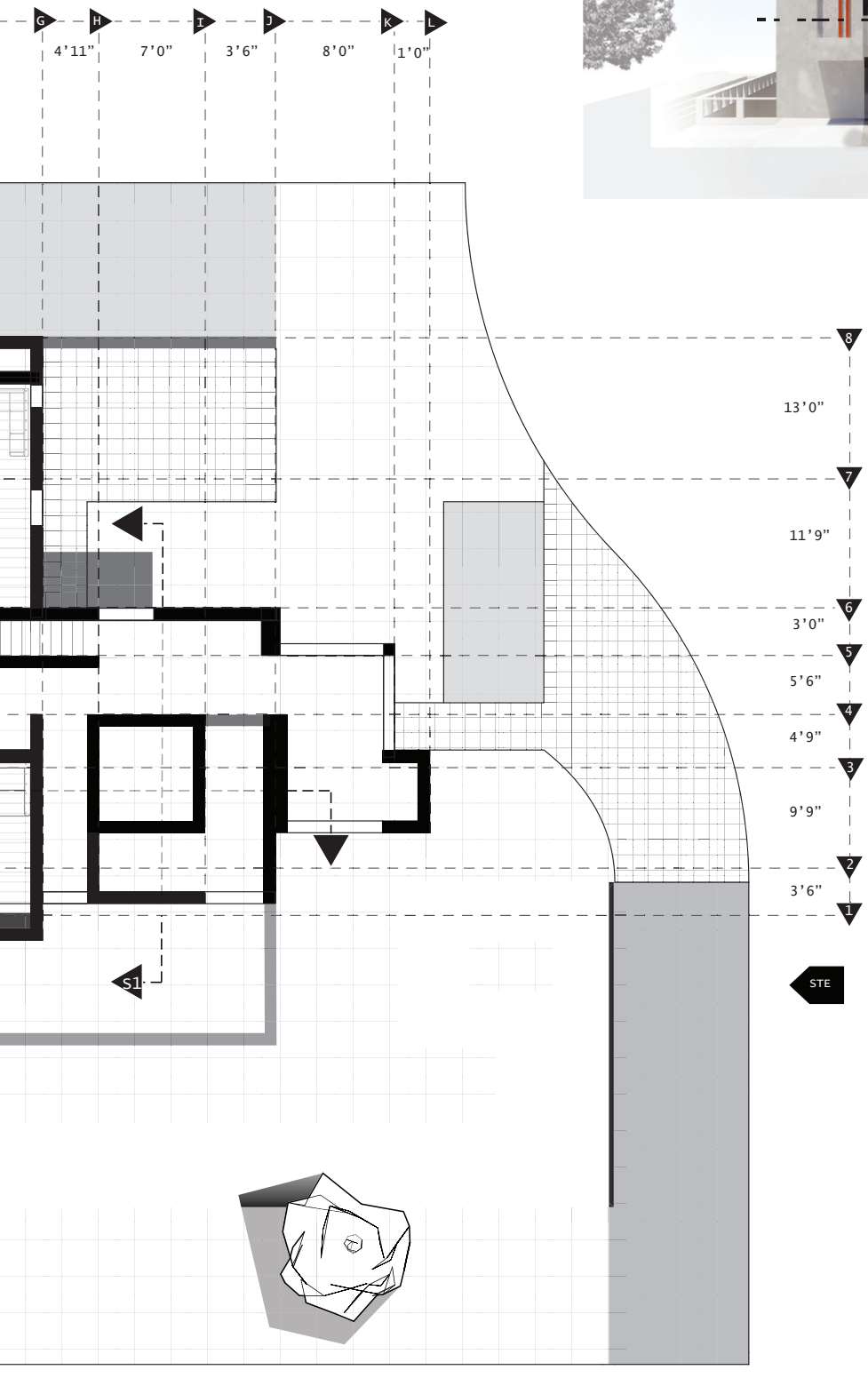


Horizontal Section (Plan) Floor 2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3’0”
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4’9”
9’9”
3’6”
S1
STE
N

This chunk detail is able to showcase the simple construction method used to construct the building. Shown here is the cantilever which has the most structural steel trusses to support it.

Street Elevation:

Side Elevation:

Section 1


s2
5
4
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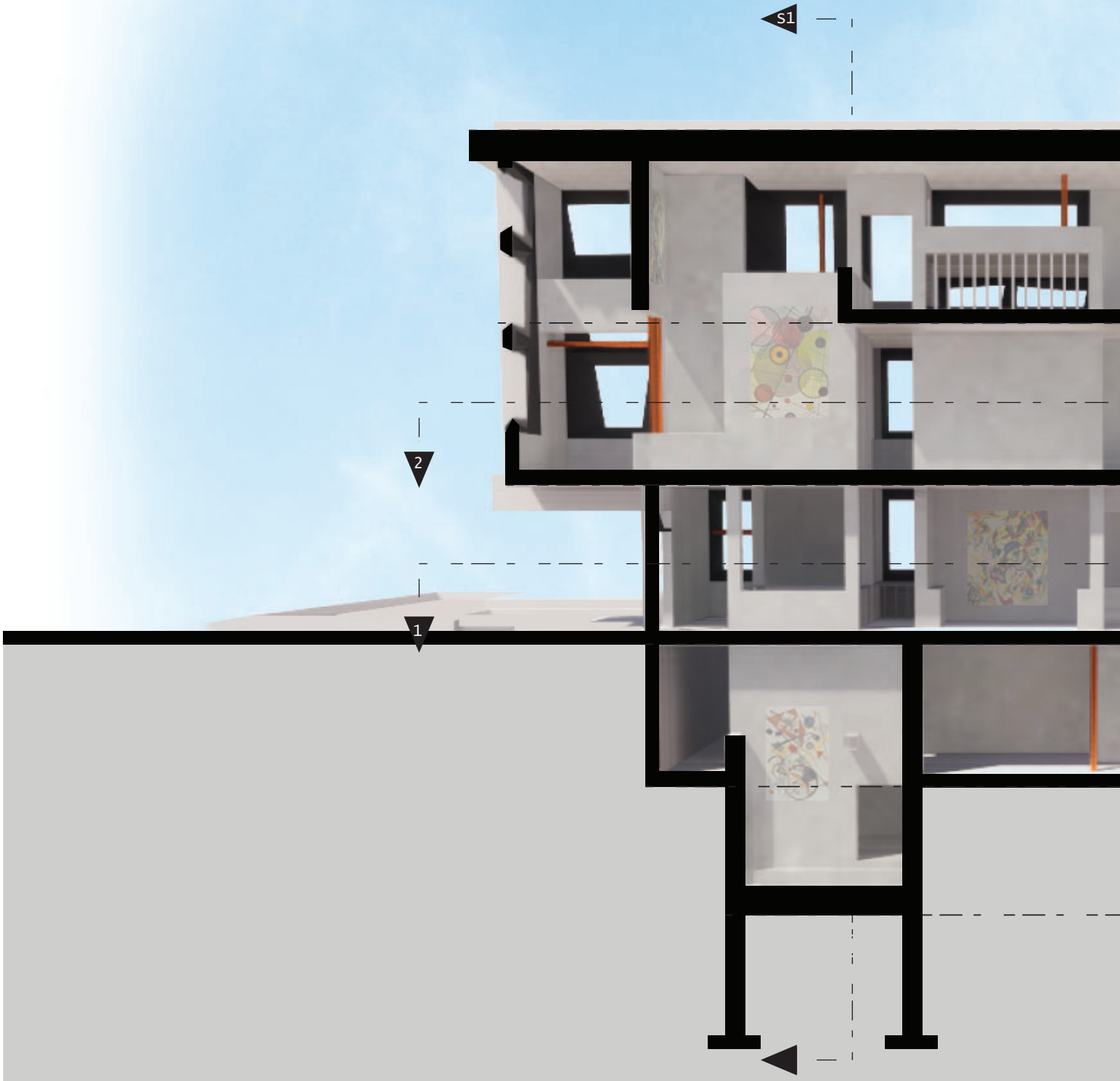
-2
-3



Section 2

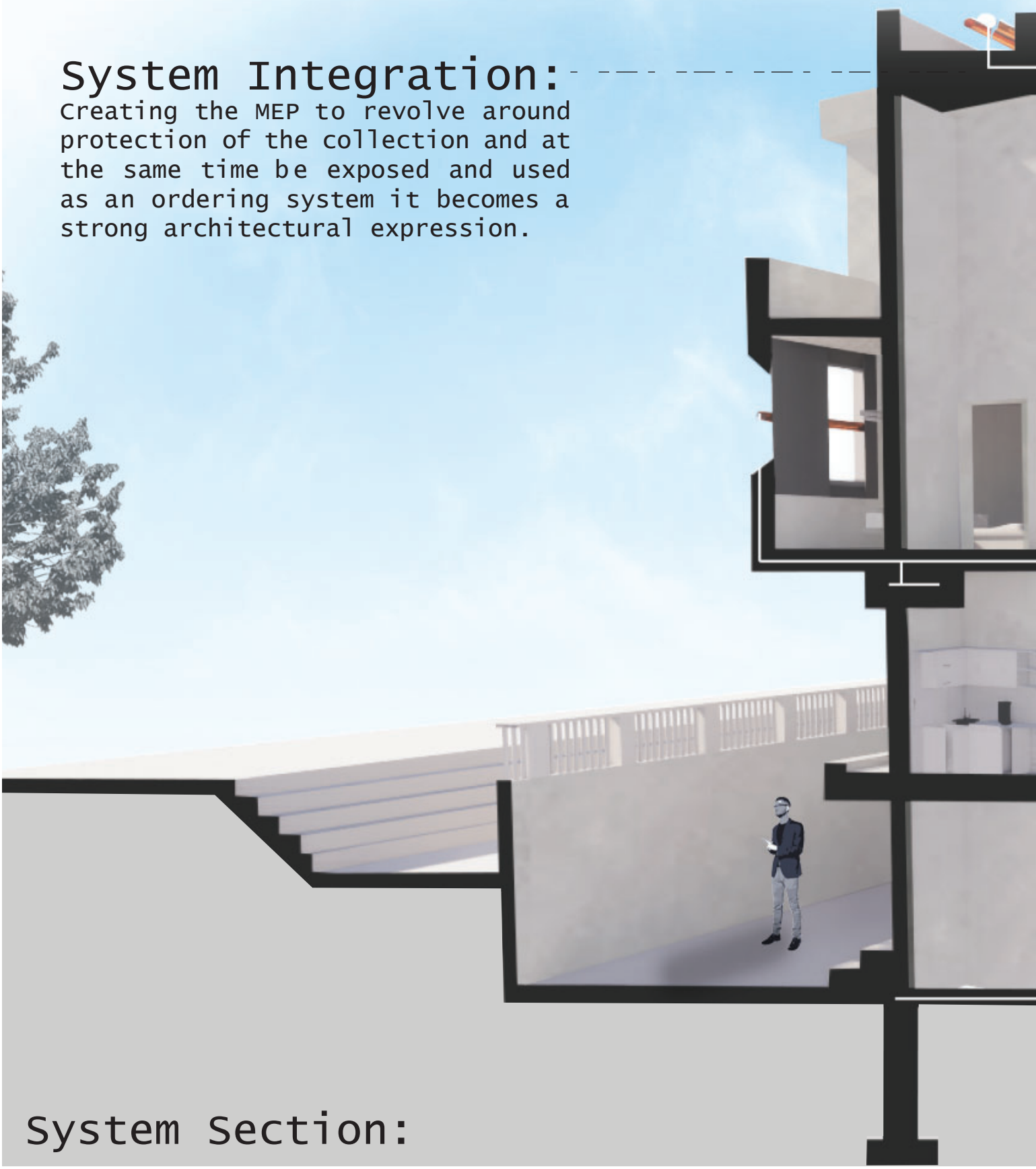

3
2
1
0
-1
-2

Interior Perspective:

This image is able to showcase the interior integration between systems, artwork and the building itself. It shows how paintings can be viewed, and how the space feels.

System Integration:

Creating the MEP to revolve around protection of the collection and at the same time be exposed and used as an ordering system it becomes a strong architectural expression.



System Section:

Interior Perspective:

This image is able to showcase the interior integration between systems, artwork and the building itself. It shows how paintings can be viewed, and how the space feels.

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